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WHAT IS CLAIMED IS:

1. A chemical sensor for measuring a chemical of interest, the sensor comprising:
  - a body having an inlet and an outlet, the body defining a chamber therein, the chamber being at least partially filled with an electrolyte;
  - at least one fiber defining a flow passageway in fluidic communication with the inlet and the outlet, the at least one fiber being adapted to pass a portion of the chemical of interest into the electrolyte; and
  - a plurality of electrodes disposed in the electrolyte.
2. The sensor of claim 1, wherein the electrolyte is regenerative.
3. The sensor of claim 1, wherein the chemical of interest is chlorine and the electrolyte is potassium bromide.
4. The sensor of claim 1, wherein at least one of the electrodes is proximate the fiber.
5. The sensor of claim 1, wherein at least one of the electrodes encircles the fiber.

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6. The sensor of claim 1, wherein the fiber includes at least one polymeric hollow fiber.

7. The sensor of claim 1, wherein a current is measured through the plurality of electrodes.

8. The sensor of claim 1, wherein a voltage across the plurality of electrodes is measured.

9. An instrument for measuring a chemical of interest, the instrument comprising:

an electrochemical sensor having a regenerative electrolyte disposed therein;

at least one hollow fiber adapted to carry sample fluid through the electrochemical sensor; and

a transmitter coupled to the electrochemical sensor, the transmitter adapted to calculate a concentration of the chemical of interest sensed by the electrochemical sensor.

10. The instrument of claim 9, and further comprising a flowmeter fluidically disposed in series with the electrochemical sensor, the flowmeter coupled to the transmitter, and wherein the transmitter further calculates concentration based at least in part upon a flow signal from the flowmeter.

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11. The instrument of claim 10, and further comprising a pH sensor fluidically disposed in series with the electrochemical sensor and coupled to the transmitter, wherein the transmitter further calculates concentration based at least in part upon a pH signal from the pH sensor and the flow signal from the flowmeter.

12. The instrument of claim 9, and further comprising a pH sensor fluidically disposed in series with the electrochemical sensor and coupled to the transmitter, wherein the transmitter further calculates concentration based at least in part upon a pH signal from the pH sensor.

13. A method of measuring a concentration of a chemical of interest, the method comprising:

passing a quantity of a sample fluid through a hollow fiber having a porous wall;  
diffusing a portion of the sample fluid across the porous wall into an electrolyte; and  
measuring an electrical parameter of the electrolyte with a plurality of electrodes disposed within the electrolyte.

14. The method of claim 13, wherein the electrolyte is regenerative.

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15. The method of claim 13, wherein the porous wall is a portion of a polymeric hollow fiber.

16. The method of claim 13, wherein the electrical parameter includes a current flowing through the plurality of electrodes.

17. The method of claim 13, wherein the electrical parameter includes a voltage across the plurality of electrodes.